



AN EMPIRICAL STUDY ON FACTORS INFLUENCING DIGITAL TRANSACTION IN INDIA: A DISTRICT LEVEL LOGISTIC APPROACH

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ABSTRACT

Digital transactions have become increasingly popular due to technological advancements, convenience, and the widespread use of the Internet and mobile devices. Digital transactions in rural India have been on the rise in recent years, driven by the government's Digital India initiative. This initiative has made significant progress in digitizing government processes by expanding internet access, and encouraging the use of technology for social and economic development. It has also played a crucial role in advancing India's position as a global IT and digital services hub. However, challenges such as digital literacy, cyber security, and infrastructure development in remote areas continue to be addressed as the program evolves. The present work finds the gap between rural and urban, male and female and technological knowledge and awareness in performing digital transactions. With the help of a logit model, it has been observed an impressive success in the implementation and spreading of digital transactions though there exists differences in many dimensions.

KEYWORDS: Digital India, Cashless Transaction, Digital Awareness, Logistic Analysis

INTRODUCTION

Digital transactions, often called electronic transactions or e-transactions, have revolutionized how we exchange value and conduct financial activities. In today's rapidly evolving digital age, traditional cash transactions are increasingly giving way to digital transactions, which involve the electronic transfer of money or the purchase of goods and services without physical currency. This transformation has been facilitated by advancements in technology and has several advantages. Digital transactions offer unparalleled convenience. With a few taps on a smartphone or clicks on a computer, individuals can pay bills, transfer funds, or make purchases from the comfort of their homes or virtually anywhere with an internet connection. Transactions happen in real-time or near real-time, eliminating the delays associated with traditional payment methods like checks or physical cash. This speed is critical for businesses and individuals needing swift financial interactions. Many digital transaction methods employ robust security measures, such as encryption and authentication protocols, to safeguard financial information. This helps protect against fraud and unauthorized access. Digital transactions leave a digital trail, making it easier to track and manage one's finances. This electronic record-keeping simplifies budgeting and financial planning. Digital transactions are inclusive, as they are accessible to people who may not have access to traditional banking services. Mobile banking and digital wallets have made financial services more widely available. Both businesses and consumers can benefit from reduced transaction costs associated with digital payments. There are typically fewer fees, especially for cross-border transactions. By reducing the need for physical cash and paperwork, digital transactions contribute to environmental sustainability by conserving resources and reducing waste. The world of digital transactions continues to evolve with innovations like cryptocurrencies, blockchain technology, and

contactless payment methods, offering new ways to conduct financial transactions.

The present work focused on a district-level study to find out the preliminary causes and indicators to improve the growth of digital transactions in both rural and urban areas. It has been tried to show an overall improvement of digital transactions at the grassroots level may lead to a digitalized economy and accelerate the financial and economical development.

OBJECTIVE

The main objective of this study is to find out the scope and challenges of acceptance of Digital transactions of rural and urban people in the district of Birbhum, West Bengal.

- To examine the effects of various demographic factors like gender, residence, education, etc. influencing the awareness of digital transactions.
- To examine how far the technological knowledge and digital awareness improves the digital transaction.

Hypothesis 1: No significant difference is observed by respondents' digital transaction based on the knowledge of digital awareness and technical knowledge.

Hypothesis 2: No significant difference is observed by respondents' perception of various factors of digital payments based on any demographic factors like age, gender, & resident.

DATA & METHODOLOGY

Data has been collected through a primary survey conducted randomly in rural and urban areas. A 7-point Likert scale has been applied for qualitative responses to generate two independent variables namely Digital Awareness (digiaware) and Technological Knowledge (techknow). The questionnaire

based on digital and technological information, and related to digital transactions have been used to construct these two variables. Following Cronbach's Alpha, the reliability has been tested against the Likert scale measurement. The progress or success of Digital Transaction has been considered as dependent variable, which is a binary response and is assumed to be influenced by demographic factors and the other two factors mentioned earlier.

Let the standard form of dependent and independent variables is

$$Y_i = \alpha + \beta X_i + U_i, \dots \dots \dots (1)$$

$$E(Y_i | X_i) = \alpha + \beta X_i = P_i, \dots \dots \dots (2)$$

$$[E(Y_i) = 0(1 - P_i) + 1(P_i)]$$

The probability is linear in x.

In contrast to the linear probability model (LPM), the logit model always produces predicted probabilities within the meaningful range [0, 1].

From equation (2),

$$P_i = \frac{1}{1 + e^{-(\alpha + \beta X_i)}} \dots \dots \dots (3)$$

$$\text{Or, } P_i = \frac{1}{1 + e^{-Z_i}} = \frac{e^{Z_i}}{1 + e^{Z_i}} \dots \dots \dots (4)$$

Equation (4) is the logistic distribution function.

P_i is the probability of accepting digital transaction, and $(1 - P_i)$ is the probability of not performing/accepting digital transaction.

$$1 - P_i = \frac{1}{1 + e^{Z_i}} \dots \dots \dots (5)$$

RESULT AND DISCUSSION

The Cronbach's Alpha test of reliability of both the variables digiaware and techknow are 0.720 & 0.714 respectively. A value of 0.60 or more indicates satisfactory internal consistency reliability in exploratory studies. The logistic regression model between the performance of digital transactions with all covariates is significant at 0.01 level of significance. The covariate digiaware is significant at 0.01 level of significance with a positive odds ratio of 15.56 (Table 1). As digital awareness increases the odds of digital transactions performed against not performed will increase. As digital awareness increases the probability of increasing digital transactions rises by 0.03 (marginal effect after logistic regression). The odds ratio of technological knowledge is 11.4 at a 0.10 level of significance (Table 1). When the technological knowledge increases, the probability of increasing digital transactions rises marginally by 0.025 for average individuals (marginal effect after logistic regression). The results reject the null hypothesis as there is a positive significant impact of digital awareness and technological knowledge over the acceptance of digital transactions.

Log likelihood = -11.685863	Number of obs = 94; LR chi2(4) = 83.43; Prob > chi2 = 0.0000; Pseudo R2 = 0.7812					
digitran	Odds Ratio	Std. Err.	z	P>z	[95% Conf. Interval]	
digiaware	15.55549	13.86447	3.08	0.002	2.711536	89.23843
techknow	11.39309	16.2235	1.71	0.088	.6991168	185.6664
resi	4.119097	5.653148	1.03	0.302	.2796357	60.67525
gender	12.98334	19.42998	1.71	0.087	.6910933	243.9139
_cons	.0009671	.0023781	-2.82	0.005	7.81e-06	.1198155

Table 1: Logistic regression

From the logistic regression, it is observed that the odds ratio of residents is positive but not significant. The odds ratio of gender is 12.98 with a 0.10 level of significance (Table 1). The male has 12.98 times the odds of the female of having performance in digital transactions. Therefore gender plays an important role in the contribution of digital transaction progress. The average urban person has a 78% chance of having digital transactions compared to 72% of rural people (table 2). Age level plays a crucial role in performing digital transactions. Older people have comparatively less probability of performing digital transactions than younger ones. Table 6 shows that the chance of performing digital transactions is 77% for the age group 20 and whereas it decreases to 72% for the age group 60. The average male person has a higher (78%) chance of accepting digital transactions than female people (68%). Certainly, there is a significant impact of demographic factors in the progress of digital transactions which rejects the null hypothesis.

Predictive margins Model VCE : OIM Expression : Pr (digitran), predict			Number of obs = 94		
	Margin	Delta-method Std. Err.	z	P>z	[95% Conf. Interval]

Resi						
rural	.7241403	.0280037	25.86	0.000	.6692541	.7790265
urban	.7828597	.0381458	20.52	0.000	.7080954	.8576241
Age						
age = 20	.7774822	.0531842	14.62	0.000	.6732431	.8817214
age = 30	.765045	.0368382	20.77	0.000	.6928435	.8372464
age = 40	.7524274	.0235957	31.89	0.000	.7061807	.7986741
age = 50	.7395465	.0223711	33.06	0.000	.6956999	.7833931
age = 60	.7263097	.0364521	19.93	0.000	.6548649	.7977545
age # gender						
age = 20 # female	.7619641	.0873485	8.72	0.000	.5907641	.9331641
age = 20 # male	.8046034	.0768755	10.47	0.000	.6539302	.9552765
age = 30 # female	.7230419	.0488405	14.80	0.000	.6273164	.8187675
age = 30 # male	.7959037	.0551661	14.43	0.000	.6877801	.9040273
age = 40 # female	.6871771	.0326562	21.04	0.000	.6231722	.7511819
age = 40 # male	.7873529	.0373054	21.11	0.000	.7142356	.8604702
age = 50 # female	.6478319	.0536159	12.08	0.000	.5427467	.7529171
age = 50 # male	.7789606	.0292903	26.59	0.000	.7215526	.8363686

Table 2: Prediction with Margins and Interaction

The interactive logistic regression also highlights that the average younger male person has a higher chance of accepting digital transactions than younger females (Table 2). As people become older the average male has significantly higher chances than female counterpart. In comparison with rural and urban people, it is significantly clear that urban people have a higher probability of accepting digital transactions than rural in every average year of age (Figure 1, 2 & 3).

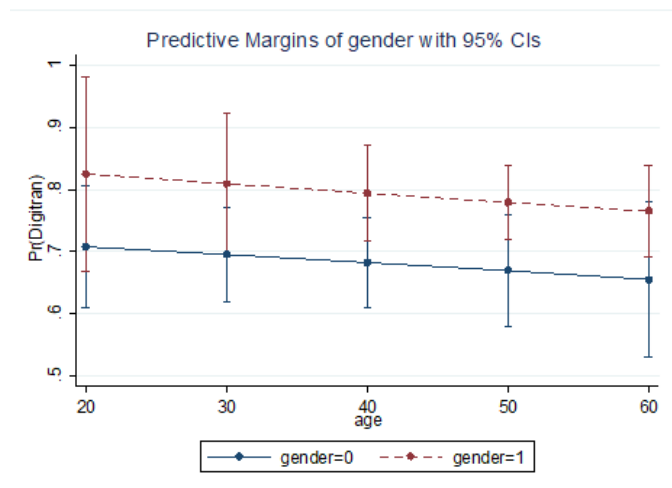


Figure 1: Marginsplot (age & gender)

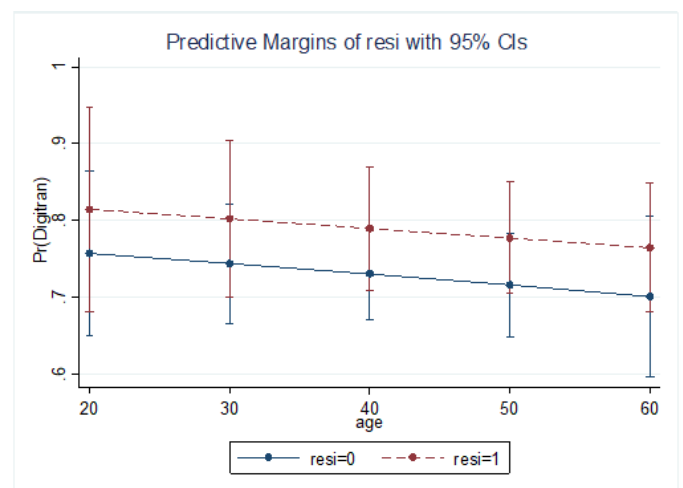


Figure 2: Marginsplot (age & resident)

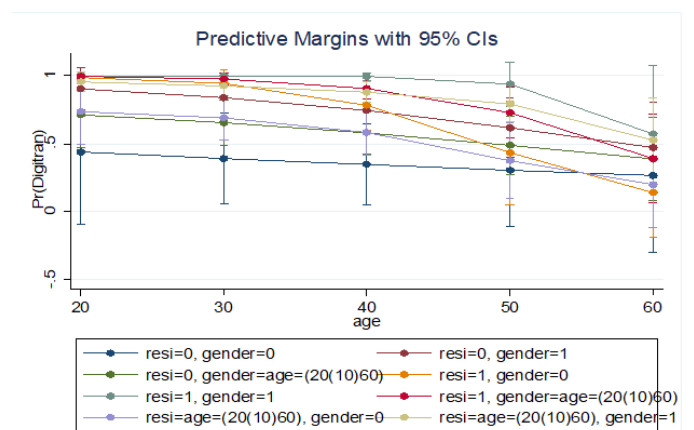


Figure 3: Marginsplot of interaction (age, gender & resident)

CONCLUSION

It is very clear from the above regression results that the wave of performance of digital transaction flows in every part of the district whether it is rural or urban. The male people are performing a higher transaction than female because in rural area they are mostly engaged in household activities rather than purchasing or buying in the market. It is not always true in case of urban female. The young and educated generations are always very concerned about any kind of technological devices and innovations than aged one. This might be the cause of higher chances of accepting digital transaction of younger people than aged on average. But the aged people are not so incapable than young as the aged male have very impressive chance of accepting digital transaction. However, the outcome of the regression result assures an impressive and successful performance of the progress and acceptance of digital transaction all over the district as well as state. The government has launched various programs and incentives to promote digital transactions in rural India. These initiatives include Jan Dhan Yojana, Aadhaar-based payments, and direct benefit transfers (DBT), which have encouraged rural residents to open bank accounts and use digital payment methods. However, challenges such as digital literacy, cyber security, and infrastructure development in remote areas continue to be addressed as the program evolves.

Many rural residents may not be familiar with digital technology or may have limited access to various resources. The interrupted internet connectivity in remote rural areas can obstruct the adoption of online transactions. Trust building in digital financial services and ensuring the security of online transactions remain important concerns. Despite these challenges, a continuous effort to address these challenges and expand digital infrastructure will further accelerate the growth of digital transactions in rural areas.

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